

REMARKS

Applicants concurrently file herewith an Excess Claim Fee Payment Letter for seven (7) excess total claims.

Claims 1-38 are all of the claims presently pending in the application. Claims 1-3, 6-7, 10-13, 15-19, 21-22, 27, 29 and 31 have been amended to more particularly define the invention. Claims 32-38 have been added to claim additional features of the invention.

It is noted that the claim amendments are made only for more particularly pointing out the invention, and not for distinguishing the invention over the prior art, narrowing the claims or for any statutory requirements of patentability. Further, Applicants specifically state that no amendment to any claim herein should be construed as a disclaimer of any interest in or right to an equivalent of any element or feature of the amended claim.

Claims 1-31 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Chefalas et al. (U.S. Patent Application Publication No. 2002/0138786) (hereinafter "Chefalas").

This rejection is respectfully traversed in the following discussion.

I. THE CLAIMED INVENTION

The claimed invention (e.g., defined by claim 1) is directed to a method of reducing warranty costs. The method includes monitoring indicators in a computer

system and discriminating between a hardware-induced outage and a software-induced outage in the computer system based on the indicators.

Conventional computer system diagnosis methods (e.g., see “Background” section of the Application at pages 1-3) include diagnosing a computer system outage after the outage occurs. Typically, when a customer experiences an outage event with a computer system, the customer or field service engineer does not know whether the event was caused by a hardware problem or a software problem. It is well known that many outages in computer systems are software-induced. However, when it is not possible to discriminate between a software-induced outage and a hardware-induced outage, the customer or field service engineer often assumes that the problem is due to hardware, in which case the hardware is returned to the manufacturer. This results in a large amount of non-defective hardware being erroneously returned to the manufacturer. When this occurs, unnecessary service costs are incurred by the manufacturer. Additionally, when a customer or field service technician is unable to determine if a outage was software-induced or hardware-induced an additional unnecessary cost is incurred by the service technician who must execute a lengthy diagnosis procedure.

The claimed invention of exemplary claim 1, on the other hand, provides a method of reducing warranty costs. The method includes monitoring indicators in a computer system and discriminating between a hardware-induced outage and a software-induced outage in the computer system based on the indicators (see e.g., Application at page 5, lines 14-16). This feature allows the claimed invention to collect pre-outage data as well as post-outage data, automatically identify system outages and automatically determine whether the outage was due to the hardware or the software while limiting the

amount of unnecessary service calls and unnecessary hardware replacements (see e.g.,

Application at page 3, lines 15-20).

II. THE PRIOR ART REFERENCE

The Examiner alleges that Chefalas teaches the claimed invention of claims 1-31. Applicants submit, however, that there are elements of the claimed invention which are neither taught nor suggested by Chefalas.

That is, Chefalas does not teach or suggest “*discriminating between a hardware-induced outage and a software-induced outage in the computer system based on the indicators*” as recited in claim 1 and similarly in claims 7, 11, 15, 20, 29 and 31.

The Chefalas patent describes a software agent that, once a problem has been detected, creates a list of hardware on the system and a list of software on the system (see e.g., Chefalas at paragraphs [0035]-[0036]). For the hardware items, it “performs a status check by polling or querying each device regarding its status of operations.” For the software items, it “scans event and application logs for the software applications” in order to determine whether they have emitted any error events.

The claimed invention, on the other hand, scans a significantly wider range of system health indicators. This allows the claimed invention to discriminate between hardware and software faults that cannot be discriminated just by polling devices and scanning error logs. The Application states “for example, to determine software health, the system health monitoring program 140 can monitor resource consumption data, system and application software error logs, system utilization and performance data, and software error counts” (see Application at page 8, lines 17-20).

To determine hardware health, the system health monitoring program 140 can use resources such as concurrent diagnostics, hardware error logs, and hardware error counts. Additional FFDC (First Failure Data Capture) information is available after the event, such as (again) error logs, crash dumps of memory, error codes, offline or power-on hardware diagnostics, and hardware error registers." (see Application page 8, line 21 through page 9, line 2).

For example, nonpaged pool bytes may be sampled. This parameter reports the number of bytes that must be kept in physical memory and cannot be paged out to disk. Thus, this is a strictly limited resource. Hence, when this parameter's limit is exceeded, the operating system may fail. A high level of utilization of this parameter therefore implies a software failure (see Application, page 15 lines 7-11).

Another parameter is committed bytes. This parameter reports the number of bytes that reside in physical memory plus the paging files, and is a limited resource. When this parameter's limit is exceeded, the operating system may fail. A high level of utilization of this parameter also implies a software failure (see Application, page 15 lines 12-15).

Yet another parameter is transmission control protocol (TCP) errors. This parameter indicates the number of errors that have been reported by the TCP/IP software. A high rate of TCP errors that are unaccompanied by Network Adapter Errors implies that there is a problem with the TCP/IP software. A high rate of TCP errors that are accompanied by Network Adapter Errors implies that there is a problem with the network adapter, which may indicate a hardware problem (see Application, page 15 lines 16-22).

The ability to use this expanded set of problem indicators (especially the resource

consumption data, system utilization and performance data, concurrent diagnostic results, and hardware error logs) represents a clear improvement not taught or suggested by Chefalas. In particular, performance problems are diagnosed in the Application, and are not discussed in Chefalas.

The software agent described in the Chefalas patent is described as being downloaded after a problem our outage has occurred, collecting the limited set of data described above, and producing a diagnosis. It does not, for example, describe an agent that runs continuously prior to an outage or problem, collects pre-problem data as well as post-problem data, automatically identifies outages and/or problems, and automatically determines whether the outage and/or problem was due to a hardware or software problem. The Application states that "additionally, the system health monitoring program 140 includes a mechanism (e.g., log 145) for permanently storing a time history of system software and hardware health data on a log device, which can then be read after an event to determine the likely cause of the event. That is, log 145 stores the data gathered across the outage (e.g., the data is available after the outage has occurred)" (see Application, page 9 line 3-8). Note that the logged data comprises the expanded set of data referred to above, not the limited set of data described in Chefalas.

Also note that the Application describes analyzing the collected pre-problem data on a computer other than the computer having the problem. This is significant because for some serious unrecoverable problems, the computer having the problem cannot be rebooted, thus no software agent can run on that computer. The data also need not always be stored on the computer being monitored, because once again, if the computer cannot be rebooted, that data might be unavailable for analysis. The Application states the

system diagnosis service (e.g., which may be incorporated into the System Health Monitoring Program 140 or which may be provided separately from the monitoring) includes a mechanism for analyzing the software and hardware health data. This service can either run on the system that has experienced the problem, or on another execution environment such as a service processor or another computer entirely (see Application, page 9, line 9-14).

The claimed invention, as opposed to Chefalas, includes a mechanism for detecting outages, faults, and/or performance problems and automatically invoking the problem discrimination function. This is significant because in the Application the problem discrimination function is automatically performed upon problem detection, without user intervention, and without requiring the user to detect or even notice that a problem has occurred. The Application states that in an exemplary embodiment "an outage/fault detector 160 is provided for detecting either an outage of the subject machine or something less than a complete outage such as a lack of performance, a fault/defect, etc. The outage/fault detector receives system health inputs from the system hardware and software to detect the outage or lack of performance, and provides an input to the memory and/or a discriminator 170 upon occurrence of an outage" (see Application at page 10, lines 1-6).

In the exemplary embodiment, upon occurrence of an outage/fault, the discriminator 170 (which includes the system health monitoring program 145 of Figure 1A) receives a signal from the detector 160 to request pre-outage data from memory 150 (or alternatively is automatically provided with pre-outage data from the memory upon the indication of an outage from the detector 160 to the memory 150) (see Application at

Then, the discriminator 170 examines the data and judges whether the outage/fault which occurred is due to faulty hardware or software and discriminates the faulty hardware or software component (and manufacturer of the same) (see Application, page 10 lines, 12-15).

The Examiner has rejected claim 16 by stating that Chefalas teaches that the software agent determines whether automatic recovery is possible, and if so, invokes an automatic recovery mechanism. The Chefalas patent, however, is oriented around automated discrimination but manual repair of problems, by a user who is looking at a web page.

The claimed invention, on the other hand, describes a fully automated solution, and teaches automatic recovery without any user intervention, if the problem is so diagnosed as being an automatically recoverable software problem. One example of such a recoverable software fault is a resource exhaustion problem (e.g., memory leak), where the system can recover by stopping and restarting the software that is causing the memory leak (Note that the data sources described by Chefalas are inadequate to detect this type of problem). Only if the automatic recovery is not possible, or if it is determined that it is a hardware problem, is the user contacted. This is a significant extension to Chefalas because it uses the analytical capability described in the application to completely avoid a service call.

Thus, as noted above, unlike conventional computer system diagnosis methods, the claimed invention of exemplary claim 1, provides a method of reducing warranty costs including discriminating between a hardware-induced outage and a software-

induced outage in the computer system based on the indicators (see e.g., Application at page 5, lines 14-16). This feature allows the claimed invention to collect pre-outage data as well as post-outage data, automatically identify system outages and automatically determine whether the outage was due to the hardware or the software while limiting the amount of unnecessary service calls and unnecessary hardware replacements (see e.g., Application at page 3, lines 15-20).

Clearly the novel features of the claimed invention are not taught or suggested by Chefalas. The Examiner attempts to rely on paragraphs [0031] - [0037] of Chefalas to support his allegations. The Examiner, however, is clearly incorrect.

That is, nowhere in these passages (nor anywhere else for that matter) does Chefalas teach or suggest a method of reducing warranty costs including discriminating between a hardware-induced outage and a software-induced outage in the computer system based on the indicators. Indeed, the Examiner does not even suggest that Chefalas teaches this claimed feature.

Chefalas merely teaches a system and method for automatically supporting one or more registered products at a computing device where the computing device is enabled to communicate with a support web server. In Chefalas, once a user detects a computer system problem or outage the user must contact the support web server. Once the user loads the web page for product support the user selects a “diagnose” button on the web page for diagnosing the user’s computer device that has failed to operate in an expected manner. The web server then uploads onto the user’s computing device a software agent for diagnosing the cause of the computer system problem or outage (see Chefalas at page 3, paragraph [0028]).

The device in Chefalas does not monitor software and hardware health indicators in a computer system problem or outage. Conversely, the method in Chefalas is not operated until after the problem or outage has occurred. Chefalas explicitly teaches that once a problem or outage has occurred the user must communicate with the online diagnosis web server to download the software agent that then diagnose the source of the problem or outage.

The term monitor is defined by *Webster's Universal Encyclopedia Dictionary* (200 edition, page 1182) as "to watch, keep track of, or check usually for a special purpose". Chefalas does not monitor the indicators (e.g., software and hardware indicators) of the computer system. Chefalas teaches a device that merely examines a computer device after a problem has occurred to diagnose and solve the specific problem that has occurred.

Therefore, Applicants submit that there are elements of the claimed invention that are not taught or suggest by Chefalas. Therefore, the Examiner is respectfully requested to withdraw this rejection.

III. NEW CLAIMS

New claims 32-38 have been added to provide more varied protection for the claimed invention and to claim additional features of the invention. These claims are independently patentable because of the novel features recited therein.

Applicants respectfully submit that new claims 32-38 are patentable over the applied reference at least for analogous reasons to those set forth above with respect to claims 1, 3-11, and 13-31.

IV. FORMAL MATTERS AND CONCLUSION


In response to Examiner's objections, the claims have been amended in a manner believed fully responsive to all points raised by the Examiner.

In view of the foregoing, Applicants submit that claims 1, 3-11, and 13-38, all of the claims presently pending in the application, are patentably distinct over the prior art of record and are in condition for allowance. The Examiner is respectfully requested to pass the above application to issue at the earliest possible time.

Should the Examiner find the application to be other than in condition for allowance, the Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary in a telephonic or personal interview. The Commissioner is hereby authorized to charge any deficiency in fees or to credit any overpayment in fees to Assignee's Deposit Account No. 50-0510

Respectfully Submitted,

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Scott M. Tulino, Esq.
Registration No. 48,317

Sean M. McGinn, Esq.
Registration No. 34,386

McGinn & Gibb, PLLC
Intellectual Property Law
8321 Old Courthouse Road, Suite 200
Vienna, VA 22182-3817
(703) 761-4100
Customer No. 21254